CANADIAN OCCUPATIONAL PROJECTION SYSTEM

OCCUPATIONAL INVENTORY OF CERTIFIED ENGINEERING TECHNICIANS AND TECHNOLOGISTS IN MANITOBA

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1. INTRODUCTION

1.1 Purpose of Project

The MANSCETT data development project is the basis for this report. The project is based on a Memorandum of Understanding that was signed between Canada Employment and Immigration (CEIC) and both the Canadian Council of Technicians and Technologists (CCTT) and the Manitoba Society of Certified Engineering Technicians and Technologists (MANSCETT). It includes a number of deliverables. These are:

- The development of survey questionnaires and completion of a mail survey of the membership.
- A computerized inventory of the Manitoba membership including basic biographic, demographic, geographic, education, employment, occupation and industry characteristics.
- A report on the data development project including methodology and recommendations.
- A brief separate report outlining technological change in Manitoba and Canada and the effects on MANSCETT members.

The MANSCETT Data Development Project is a pilot project based in Mantoba aimed at improving the understanding of the role and supply of and demand for engineering technicians and technologists. The results of the pilot project will facilitate further development, by CCTT and its constituent provincial associations, of a framework for a comprehensive national database on Canada's technicians and technologists.

1.2 Project Schedule

The work was commissioned in October 1986. The survey of the members was carried out in December with follow-up in January and February 1987. While the survey was underway, DALCOR completed and tested software for the membership and employment databases. Draft project reports were completed and tabled in March 1987.

CEIC provided the direct funding for the project. MANSCETT also made a significant contribution to the work. In addition to providing access to records and clerical support to the study team, MANSCETT members played an active role on the steering committee and office staff mailed and received questionnaires, assisted with follow up activities, provided information and permitted DALCOR staff to work from the Society offices.

1.3 Project Objective

Project objectives are summarized in Section 1.1. Detailed project objectives are contained in APPENDIX G.

2. HISTORICAL REVIEW

During the last decade, CEIC has worked extensively with occupational groups and industry sectors to improve the understanding of the labour market. This approach has been formalized to include "Memoranda of Understanding" between the Department and the private sector. The agreements commit both parties to each agreement to undertake certain tasks on a cooperative basis.

In September 1984, CEIC signed agreements with CCTT and MANSCETT. Two pilot projects were undertaken as a result of the agreements. The first was to develop an occupational checklist. The JOBSCAN group within CEIC carried out this work with the assistance and input of MANSCETT. A copy of the occupational checklist is attached as APPENDIX A. The second pilot project was a data development project for engineering technologists and technicians in Manitoba.

The data development project was awarded to DALCOR Innoventures Ltd. of Edmonton. The consultant responsibilities included the design of a survey questionnaire based on the JOBSCAN checklist and also including MANSCETT membership training and certification data, the survey itself, data processing, software development based on DBASE III and/or LOTUS 1-2-3, documentation of the project methodology and results and the development of a report on technological change and its effects on engineering technology in Canada and Manitoba.

CEIC provided technical support and review and served as the coordinator for the project. A project steering committee (APPENDIX G), which included representatives of CEIC national headquarters and regional office, CCTT and MANSCETT, met regularly with DALCOR to provide advice, review work to date and provide suggestions and guidance for the questionnaire and for the project reports.

3. DATA CLASSIFICATION AND CODING

3.1 Overview

The JOBSCAN checklist established eight basic data requirements for the survey. These were supplemented with data on employment status and level of supervision. DALCOR also assigned a 7-digit CCDO to each respondent. DALCOR developed a coding structure for each data element which would allow for roll ups of the data to various summary levels of aggregation. Other than that, the numerical coding structure employed is intended to minimize the length of each field to make the database more amenable to a PC environment. Some areas required analysis in order to establish a linkage to other statistical data. These areas are described in the following sub-sections.

3.2 Occupational Classification and Coding

The CCDO is the most commonly available occupational coding structure. The CCDO codes for engineering technicians and technologists at a seven digit level, based on occupations covered by the JOBSCAN checklist, are found in APPENDIX B.

The JOBSCAN approach does not provide a single step process for determining the CCDO for each respondent, so DALCOR reviewed each questionnaire to establish the CCDO. The process is somewhat subjective, but is based on a review of several employment benchmarks. The reported discipline of employment was used as the primary basis for coding. Then, it was adjusted, where warranted, by a review of the other data elements. The basic criteria were as follows in order of priority:

1) Discipline of work
2) Job Title
3) Work Environment
4) Principal Work Function
5) Classification (training and certification)

3.3 Industry Classification and Coding

It would be useful to identify the industry of employment in terms of Standard Industrial Classification (SIC). However, the JOBSCAN approach used as the basis for the project did not allow for accurate definition of the industry of employment. Portions of Principal Work Environment come close to the SIC grouping at a two digit level. The "Industry Sector Details" survey question conforms even more closely to the SIC structure. Unfortunately, the latter was used to show types of experience as opposed to industry of employment. The data do not allow accurate coding to SIC. DALCOR used the Principal Work Environment as the key for relatively broad industry groupings.

3.4 Geographical Classification and Coding

The system objectives included a requirement for geographical sorting of members. The data gathered include complete street addresses and postal codes for each of the respondents. Postal codes or place of residence may be used to sort the membership data geographically. Postal codes for some Manitoba communities are shown below as examples:

R1A	SELKIRK
R1N	PORTAGE
R2/R3	WINNIPEG
R7A/B	BRANDON
R7N	DAUPHIN
R8A	FLIN FLON
R8N	THOMPSON
R9A	THE PAS

DBASE III+ provides simple sort routines which can be used to carry out geostatistical analyses. To identify potential sorting criteria, the Canada Post Postal Code Manual should be reviewed. Statistics Canada also provides cross-references between postal codes and the geostatistical areas used for Census and other purposes. These relationships may also be used as a basis for analysis.

4. NON-MEMBERSHIP ESTIMATES BY TYPE OF OCCUPATION

4.1 Estimation Design

The key issue in estimating the total number of engineering technicians and technologists in Manitoba is to decide what occupations and/or educational backgrounds should be included. DALCOR assumed that the study should include all those in Group 216 of the CCDO series. The study was not intended to deal with career progression, so other occupations were excluded.

The MANSCETT membership is only a portion of the total number of engineering technicians and technologists employed in Manitoba. In 1981, the MANSCETT membership was 1,242. The 1981 Census estimated a total of 4355 engineering technicians and technologists in the experienced labour force in Manitoba (CCDO 216). Enrolments at Red River and Assiniboine Community Colleges totalled 628 in 1985/86, and there were 167 graduates in 1984/85 according to the Canadian Engineering Manpower Board Engineering Technology Enrolment Report. The increase in MANSCETT membership has ranged from 30 to 100 per annum during the last five years.

Disaggregated information on the 1981 MANSCETT membership is not available. However, the 1986 survey results provide some useful data. These have been reviewed in terms of reported job function. About 20 percent of the MANSCETT members reported that they work in management or project administration capacities; 18 percent in equipment installation; 14 percent in design and specifications; and less than 10 percent in each of the remaining work functions such as drafting or marketing.

The MANSCETT membership, excluding students and honorary members, increased 28 % (322 members) in the 1981-86 period. The number of CET's increased by about 15 % (158 members). DALCOR has assumed an overall occupational growth rate of 20 percent on average from 1981 to 1986 as the basis for projecting 1981 Census results. These data together with MANSCETT survey data projected to the entire membership are presented in Table I.

TABLE I
COMPARISON OF MANITOBA CENSUS OCCUPATIONAL DATA TO MANSCETT MEMBERSHIP

CCDO	OCCUPATION	1981 Census	1986 Projected	MANSCETT Dec 86
2160	Supervisors	255	305	285
2161	Surveyors	745	893	7
2163	Draftspersons	1,360	1,630	49
2165	Eng Technicians & Technologists	1,770	2,122	1,115
2169	Other Engineering & Architecture Occupations not elsewhere specified	225	270	12
	TOTAL	4,355	5,220	1,468

Source: Unpublished Census data and DALCOR estimates.

The Census data shown by Industry Sector are compared to the MANSCETT survey results in Table II (excluding those replying as "Other" in response to Question 7, Principal Work Environment).

TABLE II

COMPARISON OF CENSUS INDUSTRY EMPLOYMENT DATA TO MANSCETT MEMBERSHIP

INDUSTRY	1981 Census	1986 Projected		MANSCETT	
		No.	%	%	No.
Resources	140	168	3.2	6.1	90
Manufacturing	890	1,068	20.5	22.8	334
Construction	380	456	8.7	8.1	119
Trans/Util	955	1,146	21.9	17.4	256
Services	1,125	1,350	25.9	22.2	326
Public Admin	860	1,032	19.8	23.4	343
TOTAL	4,350	5,220	100.0	100.0	1,468

Source: Unpublished Census data and DALCOR estimates.

A review of Tables I and II shows that the MANSCETT membership is definitely biased towards supervisory and technician/technologist workers. This is true to a lesser extent in terms of industry where MANSCETT registers, as compared to the Census, a relatively larger proportion of members from the resources, manufacturing and public sectors and a relatively smaller proportion from the transportation, utilities and services sectors.

4.2 Rationale for Distribution in Manitoba

DALCOR has accepted the distribution by industry and occupation as reported by the Census. MANSCETT membership statistics do not conform to this distribution except at the more senior levels. There are a number of reasons for this fact. Many draftspersons do not qualify for MANSCETT membership. Surveyors have a separate organization for professionals, while rodmen, chainmen, etc. are not qualified for membership in Manitoba. MANSCETT does, however, certify survey technologists. Finally, MANSCETT tends to certify only the more highly qualified technicians and technologists.

4.3 Estimates of Non-Members

The number of non-members is determined by comparing MANSCETT membership to the projected total experienced workforce as projected to 1986. Based on our analysis, the MANSCETT membership represents 28 percent of the total potential population. The results by industry are presented in TABLE III and by occupation in TABLE IV.

TABLE III

MANSCETT MEMBERS AND NON-MEMBERS by INDUSTRY of EMPLOYMENT

INDUSTRY	1986 Est Total	MANSCETT Members	MANSCETT Non-Members
Resources	168	90	78
Manufacturing	1,068	334	734
Construction	456	119	337
Trans/Util	1,146	256	890
Services	1,350	326	1,024
Public Admin	1,032	343	689
TOTAL	5,220	1,468	3,752

Source: DALCOR estimates

TABLE IV

MANSCETT MEMBERS AND NON-MEMBERS by OCCUPATION of EMPLOYMENT

OCCUPATION	1986 Est Total	MANSCETT Members	MANSCETT Non-Members
Supervisors	305	285	20
Surveyors	893	7	886
Draftspersons	1,630	49	1,581
Eng Technicians & Technologists	2,122	1,115	1,007
Other Engineering & Architectural Occupations not elsewhere specified	270	12	258
TOTAL	5,220	1,468	3,752

Source: Dalcor estimates

4.4 Analysis of Non-Member Estimates

Surveying and drafting occupations have the largest number of Non-MANSCETT members (99 and 97 percent respectively). These are occupations where a wide range of training (from no formal training to post-secondary) and experience is present and where many of the workers with limited formal training do not qualify for certification.

Among the more highly skilled groups, MANSCETT capture rates are in the order of 50 percent or more. It is interesting to note MANSCETT registers the largest proportion of potential members from the supervisory group, an estimated 93 percent.

5. MEMBERSHIP SURVEY METHODOLOGY

5.1 Questionnaire Design

The design of the questionnaire was viewed as critical to the overall success of the project. The survey instrument was required to conform to the JOBSCAN document which had been developed. The JOBSCAN form is oriented towards job matching. This means that it is intended to capture comprehensive information which can be used to match employee qualifications to a specific job opportunity. Extensive historical data are required.

The data development project is directed to the development of employment statistics, but also to JOBSCAN objectives. It is based on a voluntary mail survey directed primarily to employed members. That is, the bulk of the respondents are employed and respond to the survey out of goodwill rather than economic need. Thus, simplicity becomes critical to ensure the highest level of response.

The questionnaire design was carefully considered to develop a format which was as simple to complete as possible, but which would still provide information to the JOBSCAN level of detail. In addition, the ability to process the document efficiently was also considered.

Given the two objectives of the project, the final questionnaire remained somewhat complex. The data elements included in each question are not entirely independent of the others. Much care is needed to complete it and the level of detail is higher than the ideal for a voluntary survey to be completed entirely without assistance.

The final questionnaire is attached as APPENDIX C.

5.2 Survey Procedures

The complex survey form required a careful survey procedure to ensure the highest possible response rate. Efforts were made to mitigate the obvious problems as much as possible. The initial questionnaire design was reviewed by the steering committee. Many suggestions were incorporated and then a pre-test survey was mailed to 50 MANSCETT members. The pre-test group was selected by MANSCETT from among the more active members in order to maximize likely returns.

The pre-test was mailed on November 14. 20 pre-test questionnaires were returned representing a 40 percent response. Problem areas with the pre-test were concentrated in two primary areas. First, the questionnaire was too complex. Members had difficulty disaggregating experience or tended to present excessive detail. Both problems made statistical analysis of supervisory, industry and other skill experience somewhat difficult and unreliable. Second, the attempt to capture information on previous employment yielded mixed results. Some reported every career change of any kind, while others appeared to present only moves from one employer to another. Most respondents presented every possible response which could be made to a question. For example, one respondent reported that he held three different levels of responsibility on November 15, 1986.

Given the limited time available and the desire to capture the maximum possible amount of information, amendments were made to the instructions but not to the main body of the questionnaire. The final survey form was an 8 page printed questionnaire together with a postage paid return envelope. A total of 1,460 copies were mailed to MANSCETT members on December 3 together with the MANSCETT Newsletter. The Newsletter included a front page feature article on the project encouraging member participation. This article is attached as APPENDIX D.

December 31, 1986 was specified for return of the questionnaire to the MANSCETT office. Early in January, DALCOR staff began a telephone follow-up campaign to all members who had not returned a survey questionnaire. In several cases, a second questionnaire was sent as the original had been thrown out or misplaced. MANSCETT arranged for a limited reprint of the questionnaire so that replacement copies could be sent to those members requesting them.

5.3 Response Rates

As of December 31, 1986, a total of 337 returns of 1,460 mailed questionnaires were in hand. This represented a 23 percent response rate. Telephone follow up increased the total returns to 628 by the final cut-off date of March 6 for a total response rate of 43 percent of the membership. This is considered an excellent response considering the complexity of the questionnaire.

Figure I shows the returns received by the week following the mailing date. Week 3 is Christmas period. Major telephone follow up occurred during weeks 6 and 7. Telephone efforts continued on a reduced basis during the following 6 weeks and then terminated.

5.4 Survey Results and Analysis

The database has the capability to be manipulated to provide a wide range of reports. An example report broken down by age and sex based on selected survey elements is presented in APPENDIX E. Summary data for several representative elements from that report are presented below:

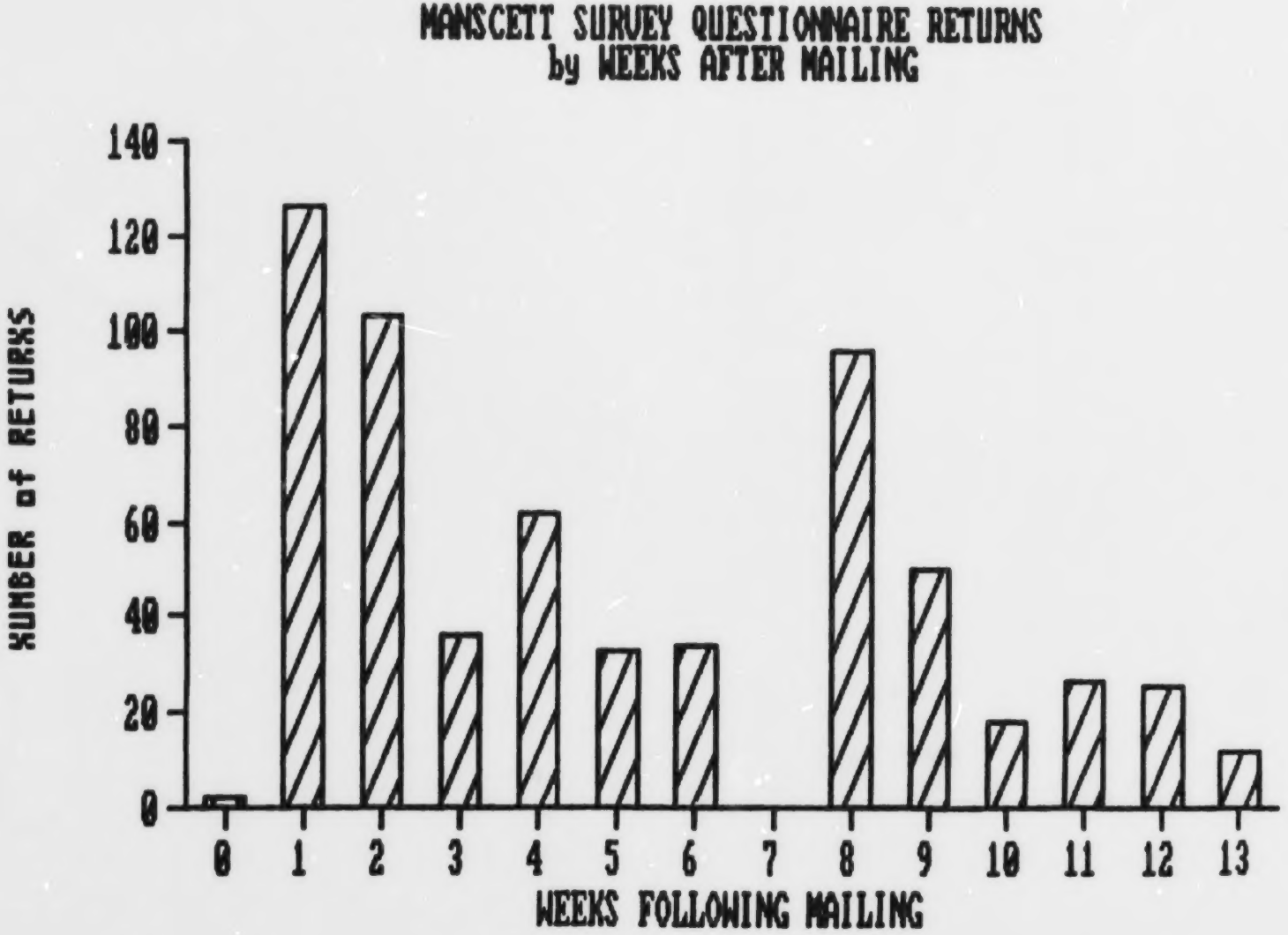
MANSCETT SURVEY QUESTIONNAIRE RETURNS
by WEEKS AFTER MAILING
NUMBER of RETURNS
140
120
100
80
60
40
20
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13
WEEKS FOLLOWING MAILING

FIGURE 1

a) Demographics

Age - 54 percent are under 35 years of age.
5 percent are over 54 years of age.

Sex - 97.5 percent are male. 2.5 percent are female.

Residence - 73.4 percent live in Winnipeg.
16.5 percent live out of province.
6.1 percent live elsewhere in Manitoba
4.0 percent live in Brandon/Dauphin

b) Employment Status

91.5 percent are employees.
3.2 percent are unemployed
3.1 percent are self-employed

c) Education

33.0 percent are Civil (including branches)
31.7 percent are Electronics/Computer
21.3 percent are Mechanical
12.1 percent are Electrical

d) Discipline of Work

31.0 percent are Civil (including branches)
24.7 percent are Electronics/Computer
17.6 percent are Mechanical
10.3 percent are Electrical

e) Function

18.2 percent Equipment Installation
14.1 percent Design & Specification
12.3 percent Management
9.3 percent Drafting
7.3 percent Project Admin

f) Level of Supervisory/Management Experience

28.1 percent Technical Specialist
17.3 percent Technical
13.8 percent Supervisor
10.6 percent Manager

g) Sector Experience

37.3 percent Construction & Municipal
21.6 percent Communications, Electronics & Control
15.2 percent Manufacturing
8.8 percent Energy
7.4 percent Transportation

6. MANSCETT MEMBERSHIP SYSTEM

6.1 Hardware and Software

The MANSCETT system is based on an IBM PC/XT compatible system. The hardware configuration specified in the Request for Proposal was:

SPERRY IBM/PC XT compatible and monitor
c/w 20 MB hard drive
1 360 K Floppy Drive
640 K RAM
MS DOS

The system ultimately installed is generally equivalent to this specification. MANSCETT hardware was installed in mid-February precluding any advance software testing on the client hardware. The software was therefore developed on DALCOR hardware configured more or less equivalent to that ultimately installed by MANSCETT. The software as developed is a menu-based package to simplify user operation and minimize training needs.

During contract negotiations, DALCOR agreed to provide DBASE III and LOTUS 1-2-3 to MANSCETT in return for certain clerical and administrative support services. With the agreement of the steering committee, DALCOR actually provided DBASE III+ and VP PLANNER instead.

DBASE III is obsolete. Data development project software was therefore produced using DBASE III+ as the development tool. This is a generic database system. It is a tool permitting rapid development and relative ease in generating custom reports. The disadvantage is that generic tools are less nimble and operate relatively slowly as databases grow larger. Some improvement can be achieved by using a compiled version of the software. This approach was used for the MANSCETT system. VP PLANNER provides LOTUS-like capabilities together with numerous enhancements including the tranfer of files from DBASE to a LOTUS 1-2-3 environment. This will be a useful capability as MANSCETT develops custom retrievals and graphical presentations of member statistics.

6.2 File Description

The system has three major working files and a basic data file. The working files are the membership file, the survey data file and the provincial file. The membership file includes membership data extracted directly from a membership application form (historical data may be obtained from hard copy membership files). The survey file contains employment data obtained from the survey questionnaire. The provincial file contains 1981 Census data covering the experienced labour force broken down by industry and occupation together with coefficients specifying the proportion of members and non-members.

There are a number of maintenance files used to provide cross reference for coding structures. These are accessed through the CODES system. Printouts of each of the maintenance files are included in the User Manual. They include the name and code used for each type of data field.

a) Membership File

This file includes the membership information which tend to remain fixed (education, certification, etc) or are commonly used for member contact (address, telephone, etc).

b) Survey File

The survey file provides data for each member who returned a survey questionnaire. Information is keyed to membership number and includes only employment and experience data. All elements in this file may change except for the record identifier which is the member number.

c) Provincial File

The non-member file is a system based on unpublished Census data for Manitoba relating occupation and industry of employment for the 216 series of occupations at a 4-digit CCDO level. It also includes fixed coefficients specifying the proportion of members and non-members based on the MANSCETT survey and projections described earlier in this report. Projections are made based on the growth in MANSCETT membership since 1981.

6.3 Operating Procedures

A system operating manual (Appendix H) has been developed for the MANSCETT staff. It includes procedures necessary to use the system.

The three primary data files (membership, survey and provincial) provide for syntax checking as data are input to the system. If a field requires numeric data, it will not accept alpha characters and vice versa. Where an error is made, the field must be re-entered with data which conform to field requirements before the operator can move to the next one. Where codes are used, only valid codes as determined from the CODE system files will be accepted.

For the most part, fields are defined as numeric, alpha or date formats. The system will accept any input which conforms to the specified format.

6.4 Reports

DALCOR developed sample reports accessible from the main system operating menu as examples of how the database may be used. Additional custom reports may be generated by MANSCETT using the DBASE III+ package included with the system. By linking the databases through the VP PLANNER package, graphical outputs can also be produced.

Various report may be produced from the database. A sample report printout is included in Appendix E. The reports developed by DALCOR which are available on the system menu are listed below:

Membership System

- Membership sorted alphabetically by Name
- Membership sorted by Membership Number
- Mailing Labels by Preferred Mailing Address

Survey Questionnaire System

- Analysis by Age Cohort - Numbers of Responses
  - Percentage of Responses
- Analysis by Experience - Number of Responses
  - Percentage of Responses
- Analysis by Age/Sex - Number of Responses
  - Percentage of Responses

Provincial System (including Non-Members)

- Members & Non-Members by Occupation & Industry

Note that this report is based on the growth in MANSCETT membership since 1981. Membership at that time was 1,146 members and associates. The membership variable may be used as an exogenous variable to simulate other rates of growth if desired.

6.5 Data Confidentiality and Ownership

In the minds of most respondents, the data which have been assembled are sensitive. Most people prefer such data to be held in confidence. At this time, MANSCETT is not large enough to require comprehensive security arrangements. All staff will work with the files from time to time. What is more important is that they understand the need to use the data in a manner which respects the confidence of individuals.

The MANSCETT office is open and members and non-members as well as staff have direct access to the office area. DALCOR recommends that MANSCETT establish a password system to protect against unauthorized use of the system. This is primarily for off-hours protection as the system will normally be monitored by office personnel throughout working hours. DALCOR also recommends that only personnel authorized by the Office Manager be permitted to use the computer system. This can be best enforced through installation of a key lock device on the hardware.

7. RECOMMENDATIONS

DALCOR has developed a number of recommendations based on the specific events and results which occurred during the course of the project. These recommendations are offered to assist in future work at a national or provincial level.

7.1 Data

A data base is most efficient when it gathers a limited amount of information. The larger the number of fields, the more inefficient the processing becomes. The MANSCETT pilot project combines job matching informational objectives (based on the JOBSCAN occupational checklist) with information to produce labour market statistics for human resource planning (COPS). Both purposes would be better served if the objectives could be separated.

DALCOR recommends that the objectives of the data development project be reviewed to establish priorities and identify the optimal level of detail which is necessary. For example, a question which gathers clear data on industry of employment, in addition to the range of an individual's experience, is required.

DALCOR recommends further that serious consideration be given to clearly separating the objectives by creating two distinct systems; one for job matching and another for labour market analysis. Where feasible, common data elements should be shared between the two systems.

7.2 Questionnaire

Questionnaire design for the pilot system was constrained by the need to conform to the basic outline of the JOBSCAN Checklist. This led to a situation in which multiple responses to some questions were inevitable. The recommendations in 7.1 above will, if implemented, resolve much of this difficulty and allow a shorter and less complex questionnaire to be used.

Voluntary surveys should be as simple as possible. DALCOR believes that a short, easy to complete survey form is superior to a complex and involved form. One way to accomplish this is to reduce the data which are gathered. In our view, this could be accomplished by removing the historical portion of the data from the questionnaire and gathering current employment data only.

DALCOR recommends that historical data be gathered through a revised application form. Current employment data should be obtained using a simplified questionnaire with much less detailed coding structure and only a single response (or priorized set of responses) to each question.

7.3 Survey

Survey timing and follow-up are critical to maximum response. The level of response achieved in the pilot project is approximately twice that usually achieved by MANSCETT for their surveys. This was accomplished by a personal telephone call to all non-respondents and provision of new questionnaires to more than ten percent of those who had not replied. This level of effort will become very expensive on a national scale or for larger organizations.

DALCOR recommends that such surveys be carried out in Spring or Fall. During the Christmas season there are mail delays and there is a tendency for the survey materials to be lost or thrown out.

7.4 Hardware and Software

The demands imposed on the system in terms of record content and reporting are pushing the ideal limits of a PC system. With only 629 records in the questionnaire database, processing time (using a Clipper compiled version) for labour market statistical reports is nearly 30 minutes. This means that alternative approaches should be used for the larger technician and technology societies.

The use of generic database language and a very detailed file structure means that a PC system will not be the answer for larger provincial societies or for a national system. Such systems will require a more powerful system, custom programming from scratch or reduced levels of detail.

7.5 Data Management

The pilot project includes both hard copy (raw) data and electronic media. Procedures are necessary to ensure security and provide for updating.

DALCOR recommends that survey questionnaires be stored together with other membership data under lock and key.

DALCOR recommends that a simplified questionnaire be developed (see 7.2 above) and circulated annually to all members. The questionnaire should gather current member data only and be pre-printed with existing data for each member. Members need only indicate changes and the database will only have to be updated if changes have occurred.

DALCOR recommends regular back-up of data. This should be done every few hours when the files are updated. Hard copy of data which have been entered since the time of the last back-up should be kept together to permit recovery in the event of a system failure. A regular electronic back-up procedure must be established by MANSCETT. An annual membership report should be produced on December 31 each year and the entire database copied to a floppy disk and archived. (A proposed procedure is included in the system operating manual for backing up the databases to floppy disks).

DALCOR recommends that MANSCETT install password protection on the system to prevent unauthorized use. A key lock for the computer should be installed as the premises are regularly used for meetings and other purposes and office staff may not be in visual contact with the computer at all times. Floppy disks (Software and membership data) should be kept in a locked container at all times when not in use.

7.6 National System

The pilot has demonstrated the viability of the project. However, there is a need to simplify any national database. This would be best accomplished by developing two distinct questionnaires and software packages. Job matching (personal employment history) concepts should be separated from the generation of labour market statistics. A smaller hardware configuration will then be able to handle both. The statistical database will be less complex and much more nimble. The employment matching system (JOBSCAN) will have fewer records and thus not bog down trying to process records covering the entire membership.

Database detail should be limited to, at most, a 2-digit coding structure for each data element except for Occupation, where 7-digit CCDO structure is desireable. Gathering of labour market information from members should concentrate on obtaining "current employment" data for:

- Occupation of Employment
- Industry of Employment
- Age
- Sex
- Place of Residence
- Field of Education
- Field of Practice
- Employment Status
- Level of Responsibility

Historical data should develop over time based on annual surveys. If it is desireable to obtain these data more quickly, a special survey should be considered.

7.7 Analysis

Cross-sectional analysis correlating three or more dimensions of an occupational database is usually required before any meaningful insights can be gained. For example, the number of members with specific educational credentials provides limited understanding. More is gained by determining which industries have the highest level of education, whether increased education translates into increased responsibility, and where unemployment is concentrated. The potential assessments are extremely broad. The benefits to be gained depend to some extent on the ingenuity applied to the analytical process itself.

DALCOR therefore recommends that MANSCETT encourage CCTT to establish a National Human Resource Planning Committee to assess the types of data to be gathered and to develop national guidelines and objectives for occupational analysis using the database.

APPENDIX A

JOBSCAN CHECKLIST

Emploi et Immigration Canada | Employment and Immigration Canada

ENGINEERING TECHNICIANS AND TECHNOLOGISTS

III CERTIFICATION

A ☐ Certified within Canada:
- 1 ☐ Engineering technician, specify province(s)/territory(ies): _____
- 2 ☐ Engineering technologist, specify province(s)/territory(ies): _____
- 3 ☐ Other, specify: _____

B ☐ Certified outside of Canada, specify: _____

C ☐ Graduate-in-training:
- 1 ☐ Engineering technician 2 ☐ Engineering Technologist

D ☐ Other, specify: _____

IV OCCUPATIONAL INFORMATION

A MAJOR ENGINEERING TECHNOLOGY DISCIPLINES

	a College Education	Work Experience b 0-2 yrs.	c 2-5 yrs.	d 5-10 yrs.	e +10 yrs.
1 Civil	☐	☐	☐	☐	☐
i ☐ Structural iv ☐ Transportation					
ii ☐ Municipal v ☐ Surveying*					
iii ☐ Construction vi ☐ Architectural					
2 Mechanical	☐	☐	☐	☐	☐
3 Electrical	☐	☐	☐	☐	☐
4 Electronics/Computer	☐	☐	☐	☐	☐
5 Chemical	☐	☐	☐	☐	☐
6 Mineral resources/Metallurgy	☐	☐	☐	☐	☐
7 Industrial	☐	☐	☐	☐	☐
8 Environmental/Geosciences	☐	☐	☐	☐	☐
9 Biological/Biomedical	☐	☐	☐	☐	☐
10 Other, specify: _____	☐	☐	☐	☐	☐

* Please also refer to Surveyors and Planners checklist.

B PRINCIPAL WORK FUNCTIONS

	a 0-2 yrs.	b 2-5 yrs.	c 5-10 yrs.	d +10 yrs.	i Most recent work experience
1 Drafting *	☐	☐	☐	☐	☐
2 Design and specifications writing	☐	☐	☐	☐	☐
3 Equipment installation, maintenance and servicing	☐	☐	☐	☐	☐
4 Facilities inspection and maintenance	☐	☐	☐	☐	☐
5 Plant and industrial operations/ production	☐	☐	☐	☐	☐
6 Quality control/quality assurance	☐	☐	☐	☐	☐
7 Standards inspection/Regulatory investigation	☐	☐	☐	☐	☐
8 Laboratory analysis	☐	☐	☐	☐	☐
9 Process/Product development	☐	☐	☐	☐	☐
10 Instrumentation and control	☐	☐	☐	☐	☐
11 Project administration	☐	☐	☐	☐	☐
12 Research and development	☐	☐	☐	☐	☐
13 Sales and technical marketing	☐	☐	☐	☐	☐
14 Management	☐	☐	☐	☐	☐
15 Education/Teaching	☐	☐	☐	☐	☐
16 Other, specify: _____	☐	☐	☐	☐	☐

* May also wish to refer to Drafting Occupations checklist.

C PRINCIPAL WORK SECTORS/INDUSTRIALLY RELEVANT AREAS

	a 0-2 yrs.	b 2-5 yrs.	c 5-10 yrs.	d +10 yrs.	i Most recent work experience
1 Fossil fuel resources -see section IV-D-1	☐	☐	☐	☐	☐
2 Mineral resources/Mining -see section IV-D-2	☐	☐	☐	☐	☐
3 Agriculture -see section IV-D-3	☐	☐	☐	☐	☐
4 Forestry and logging -see section IV-D-4	☐	☐	☐	☐	☐
5 Fisheries -see section IV-D-5	☐	☐	☐	☐	☐
6 Construction and municipal sector -see section IV-D-6	☐	☐	☐	☐	☐
7 Transportation sector -see section IV-D-7	☐	☐	☐	☐	☐
8 Energy sector -see section IV-D-8	☐	☐	☐	☐	☐
9 Environmental engineering and geosciences -see section IV-D-9	☐	☐	☐	☐	☐
10 Communications, electronics and control systems -see section IV-D-10	☐	☐	☐	☐	☐
11 Manufacturing sector -see section IV-E	☐	☐	☐	☐	☐
12 Other, specify: _____	☐	☐	☐	☐	☐

D DETAILS OF WORK SECTORS/INDUSTRIALLY RELEVANT AREAS

(excluding manufacturing, see section IV-E)

	i Some work experience	ii Extensive work experience
1 Fossil Fuel Resources		
a Type of Fuel:		
i ☐ Conventional crude petroleum and natural gas		
ii ☐ Oil sands and heavy oil		
iii ☐ Coal		
iv ☐ Other, specify: _____		
b Exploration	☐	☐
c Drilling	☐	☐
d Production	☐	☐
e Facilities	☐	☐
f Pipelines	☐	☐
g Geotechnical studies	☐	☐
h Other, specify: _____	☐	☐

	i Some work experience	ii Extensive work experience
2 Mineral Resources/Mining		
a Type of ore:		
i ☐ Ferrous metal		
ii ☐ Base metal		
iii ☐ Precious metal		
iv ☐ Uranium		
v ☐ Industrial/Non-metallic minerals		
vi ☐ Other, specify: _____		
b Underground mines	☐	☐
c Surface mines/quarries	☐	☐
d Milling and concentrating	☐	☐
e Corrosion studies	☐	☐
f Geotechnical studies	☐	☐
g Other, specify: _____	☐	☐
3 Agriculture		
a Farm land resources	☐	☐
b Farm mechanization	☐	☐
c Crop processing and storage	☐	☐
d Drainage and irrigation	☐	☐
e Agricultural facilities /buildings	☐	☐
f Waste handling and energy conservation	☐	☐
g Other, specify: _____	☐	☐
4 Forestry and Logging		
a Forests and woodlands	☐	☐
b Logging	☐	☐
c Forest/wood industries	☐	☐
d Other, specify: _____	☐	☐
5 Fisheries		
a Fishery resources	☐	☐
b Fish by-products processing	☐	☐
c Fishing vessels, gear and equipment	☐	☐
d Other, specify: _____	☐	☐

JOBSCAN

Canada

	a -2 yrs.	b 2-5 yrs.	c 5-10 yrs.	d +10 yrs.
8 Printing and publishing	☐	☐	☐	☐
9 Metals smelting and refining	☐	☐	☐	☐
i ☐ Smelting iv ☐ Electrolytic techniques				
ii ☐ Hydrometallurgy v ☐ Other, specify:				
iii ☐ Pyrometallurgy _____				
10 Metal fabrication	☐	☐	☐	☐
i ☐ Structural vi ☐ Wire and rod				
ii ☐ Pressure vessels vii ☐ Forging				
iii ☐ Mechanical equipment viii ☐ Rolling				
iv ☐ Casting and foundry work ix ☐ Welding				
v ☐ Extrusions x ☐ Other, specify: _____				
11 Machinery (excluding electrical)	☐	☐	☐	☐
i ☐ Agricultural implements iv ☐ Construction/ Mining/Material handling equipment				
ii ☐ HVAC systems				
iii ☐ Hydraulics/Pneumatics v ☐ Other, specify: _____				
12 Transportation equipment	☐	☐	☐	☐
i ☐ Aircraft and parts iv ☐ Shipbuilding				
ii ☐ Cars/Trucks/Trailers and parts v ☐ Space vehicles				
vi ☐ Other, specify: _____				
iii ☐ Railroad rolling stock				
13 Electrical and electronic products				
i ☐ Appliances vi ☐ Computers and associated equipment				
ii ☐ Lighting systems				
iii ☐ Audio/Acoustic systems vii ☐ Industrial equipment				
iv ☐ Navigational equipment viii ☐ Semi-conductors				
v ☐ Telecommunications equipment ix ☐ Other, specify: _____				
14 Non-metallic mineral products and construction material	☐	☐	☐	☐
15 Petroleum, coal, and gas products	☐	☐	☐	☐
i ☐ Production ii ☐ Refining iii ☐ Other, specify: _____				
16 Chemicals and chemical products	☐	☐	☐	☐
i ☐ Industrial and inorganic chemicals				
aa ☐ Chloralkalis cc ☐ Sulphur products				
bb ☐ Mineral acids dd ☐ Other, specify: _____				
ii ☐ Agricultural chemicals				
aa ☐ Pesticides cc ☐ Other, specify: _____				
bb ☐ Fertilizers				
iii ☐ Petrochemicals				
aa ☐ Primary/Monomers cc ☐ Solvents				
bb ☐ Intermediates, plastics, resins dd ☐ Other, specify: _____				
iv ☐ Organic and specialty chemicals				
aa ☐ Detergents and surfactants dd ☐ Chemical intermediates				
bb ☐ Water treatment chemicals ee ☐ Other, specify: _____				
cc ☐ Paints and protective coatings				
v ☐ Pharmaceuticals and medicines				
vi ☐ Other, specify: _____				
17 Scientific and professional equipment	☐	☐	☐	☐
18 Other, specify: _____	☐	☐	☐	☐

F DRAFTING, DESIGN AND SPECIFICATIONS	i some work experience	ii extensive work experience
1 ☐ Drafting		
a Shop drawings	☐	☐
b Detailing	☐	☐
c Project	☐	☐
d Presentation drawing	☐	☐
e Computer aided drafting (C.A.D.)	☐	☐
f Other, specify: _____	☐	☐
2 ☐ Design		
a Detail design	☐	☐
b Design modification	☐	☐
c Conceptual design	☐	☐
d Computer aided design and manufacturing (C.A.D./C.A.M.)	☐	☐
e Process design	☐	☐
f Product	☐	☐
g Other, specify: _____	☐	☐
3 ☐ Specifications		
a Interpretation	☐	☐
b Writing and developing	☐	☐
c Specialized area, specify: _____	☐	☐
d Other, specify: _____	☐	☐

G SURVEYING	a some work experience	b extensive work experience
1 Architectural	☐	☐
2 Urban and regional planning	☐	☐
3 Resources exploration	☐	☐
4 Cartographic	☐	☐
5 Other, specify: _____	☐	☐

H INDUSTRIAL ENGINEERING/MANUFACTURING PROCESSES	i some work experience	ii extensive work experience
1 ☐ Materials testing		
a Materials properties analysis	☐	☐
b Performance testing	☐	☐
c Component and parts failure analysis	☐	☐
d Non-destructive testing	☐	☐
e Other, specify: _____	☐	☐
2 ☐ Fabrication materials and processes		
a Sheet metal	☐	☐
b Wood	☐	☐
c Structural steel	☐	☐
d Plastics	☐	☐
e Composites	☐	☐
f Other, specify: _____	☐	☐
3 ☐ Test cells/rigs		
a Conducting tests	☐	☐
b Developing test procedures	☐	☐
c Developing test equipment	☐	☐
d Other, specify: _____	☐	☐
4 ☐ Manufacturing processes		
a Process troubleshooting	☐	☐
b Procedures analysis and modification	☐	☐
c Tooling requirements evaluation	☐	☐
d Material and labour resource estimating	☐	☐
e Assembly/Production line balancing and supervision	☐	☐
f Process design and development	☐	☐
g Prototype/Production model design and development	☐	☐
h Equipment design	☐	☐
i Packaging	☐	☐
j Other, specify: _____	☐	☐
5 ☐ Process controls/automation		
a Computerized numerical controls	☐	☐
b Automated production/robotization	☐	☐
c Modification of computer software	☐	☐
d Other, specify: _____	☐	☐
6 ☐ Additional experience		
a Fire and safety systems	☐	☐
b Plant and office layout	☐	☐
c Labour standards development and assessment	☐	☐
d Industrial health/safety	☐	☐
e Other, specify: _____	☐	☐

APPENDIX B

CCDO Codes for Engineering Technicians and Technologists

CCDO TITLES RE: MANSCETT DATA DEVELOPMENT PROJECT

		Respondents
2160	Supervisors, other occupations in Architecture and Engineering	122
2161	Surveyors	3
2163	Draughtsmen	21
2165	Architectural and Engineering Technologists and Technicians	477
2165-110	Aerospace-Engineering Technologist	9
2165-114	Architectural Technologist	1
2165-118	Chemical Engineering Technologist	1
2165-122	Civil Engineering Technologist	105
2165-126	Electrical Engineering Technologist	45
2165-130	Electronic Engineering Technologist	109
2165-134	Industrial Engineering Technologist	
2165-138	Marine Engineering Technologist	
2165-142	Mechanical Engineering Technologist	70
2165-146	Metallurgical Engineering Technologist	1
2165-150	Mining Engineering Technologist	2
2165-154	Nuclear Engineering Technologist	1
2165-156	Nuclear Technologist	
2165-158	Petrochemical Engineering Technologist	
2165-199	Other Architectural and Engineering Technologist	48
2165-210	Aerospace Engineering Technician	1
2165-214	Agricultural Engineering Technician	
2165-218	Chemical Engineering Technician	
2165-222	Civil Engineering Technician	26
2165-224	Construction Engineering Technician (Military)	
2165-225	Drilling-fluid Technician, Offshore Drilling Rig	
2165-226	Electrical Engineering Technician	13

Continued.....

		Respondents
2165-230	Electronic Engineering Technician	21
2165-234	Geological Engineering Technician	
2165-238	Industrial Engineering Technician	
2165-242	Marine Engineering Technician	
2165-246	Mechanical Engineering Technician	13
2165-250	Metallurgical Engineering Technician	
2165-254	Mining Engineering Technician	
2165-258	Nuclear Engineering Technician	
2165-262	Petrochemical Engineering Technician	
2165-266	Petroleum Engineering Technician	
2165-299	Other Engineering Technicians (includes Robotics technician)	11
2169	Other occupations in Architecture and Engineering, n.e.c.	5

Source of Data: MANSCETT

APPENDIX C

SURVEY QUESTIONNAIRE

MANSCETT DATA DEVELOPMENT PROJECT

MANSCETT is cooperating with Canada Employment and Immigration (CEIC) to develop a human resource data base for Technicians and Technologists. This is a pilot program which, if successful, will be extended to the rest of Canada.

The purpose of the pilot program is to provide a basis for a program covering all CCTT member societies, as well as facilitate national and regional human resource planning by CCTT for their membership. The survey has been contracted to Dalcor Innoventures Ltd., a Western Canadian human resources consulting firm. The entire cost of the project is covered by Employment and Immigration Canada.

Participation in the survey is voluntary. However, you are encouraged to respond. Personal data will be used to update MANSCETT membership records. Employment information will be consolidated to develop a statistical description of MANSCETT membership. These results will be made available to CEIC in summary form. No detailed information which would identify you or your response will be provided to CEIC.

Please complete the questionnaire and return it by December 31, 1986 in the enclosed envelope to:

MANSCETT
5, 1767 Portage Avenue
Winnipeg, Manitoba
R3J 0E7

Thank you for your assistance.

Sincerely,

J. R. McDonald

CE

~~CETTE~~ **QUESTIONNAIRE EST DISPONIBLE AUSSI EN FRANCAIS.**

MANSCETT DATA DEVELOPMENT QUESTIONNAIRE

INSTRUCTIONS

- Please complete all parts if possible.
- If you have trouble with any question, skip to the next and carry on.
- Select the code which most accurately applies from the list printed to the right or below each question. Where no codes are shown, write in words which most accurately answer the question in the space provided.
- Choose codes only when you have meaningful work experience in an area.
- Provide your best estimate of the extent (some or extensive) AND duration (in years) of experience for each discipline, function, work environment and industry sector which you select for Questions 3, 4, 7 and 8.
- Indicate the extent (some or extensive) of your supervisory experience for each area where you have acquired expertise under Question 5.
- Indicate the extent (some or extensive) AND your best estimate of duration (in one or more years) of experience you have acquired for skill areas under Question 9.
- If you have any problems or questions, please contact the MANSCETT office — Telephone 885-2788 and a Dalcor representative will be pleased to assist you.

CETTE QUESTIONNAIRE EST DISPONIBLE AUSSI EN FRANCAIS.

OFFICE USE ONLY MANSCETT Member Number _____

Classification _____ Discipline _____ Option _____

Status _____

Date Certified _____ Last Review _____ Reclassification _____

MANSCETT DATA DEVELOPMENT QUESTIONNAIRE

Last Name _____ First Names _____

Date of Birth ____ / ____ / ____ Sex M/F _____
Month Day Year

Residence Address Suite No. _____ Street _____

City/Town _____

Prov. _____ Postal Code _____ - _____

Residence Telephone (____) ____- _____

Please provide a complete and accurate postal code.

Employer Name _____

Business Address Suite No. _____ Street _____

City/Town _____

Prov. _____ Postal Code _____ - _____

Business Telephone (____) ____- _____

Please provide a complete and accurate postal code.

Preferred Mailing Address (check one) Business _____ Residence _____

EDUCATION — Provide details for each program completed successfully.

Discipline	Specialty	Year Completed	Institution Name	Location of Institution City, Prov. or Country

OTHER COURSES — Provide details for each program completed successfully.

Discipline	Specialty	Year Completed	Institution Name	Location of Institution City, Prov. or Country

EDUCATION CODES

Code	Discipline
010	Civil
011	Structural
012	Transportation
013	Municipal
014	Surveying
015	Construction
016	Architectural
020	Mechanical
030	Electrical
040	Electronics/Computer
050	Chemical
060	Mineral Resources/ Metallurgy
070	Industrial
080	Environmental/Geosciences
090	Biological/Biomedical
100	Other

Specify _____

1 **POSITION TITLE** (as of Nov. 15 or most recent position)

_____

2. **EMPLOYMENT STATUS** (as of Nov. 15, 1986)

Employed	_____	01
Self-employed	_____	02
Unemployed	_____	03
Retired	_____	04
Other not in labour force	_____	05 Specify _____

If unemployed, for how long _____ (yrs.) _____ (months)

3. **DISCIPLINES OF WORK EXPERIENCE**
(Show current and all previous experience beginning with most recent.)
Check 'some' or 'extensive' as appropriate and indicate number of years of experience.

	DISCIPLINE Code	EXPERIENCE Some	EXPERIENCE Extensive	Year(s)
Most Recent	_____	_____	_____	_____
Previous Positions	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____

Code	Discipline
010	Civil
011	Structural
012	Transportation
013	Municipal
014	Surveying
015	Construction
016	Architectural
020	Mechanical
030	Electrical
040	Electronics/Computer
050	Chemical
060	Mineral Resources/ Metallurgy
070	Industrial
080	Environmental/Geosciences
090	Biological/Biomedical
100	Other
	Specify _____

4. **PRINCIPAL WORK FUNCTION**
(Show current and all previous experience beginning with most recent.)
Check 'some' or 'extensive' as appropriate and indicate number of years of experience.

	FUNCTION Code	EXPERIENCE Some	EXPERIENCE Extensive	Year(s)
Most Recent	_____	_____	_____	_____
Previous Positions	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____

Code	Function
01	Drafting
02	Design and specifications writing
03	Equipment installation maintenance & servicing
04	Facilities inspection and maintenance
05	Plant and industrial operations/production
06	Quality control/quality assurance
07	Standards inspection/ regulatory investigation
08	Laboratory analysis
09	Process/product dev.
10	Instrumentation & control
11	Project administration
12	Research and development
13	Sales and technical marketing
14	Management
15	Education/Teaching
16	Other
	Specify _____

5. SUPERVISION AND MANAGEMENT EXPERIENCE

(Indicate extent of your experience in all areas of expertise which apply.)
Check 'some' or 'extensive' as appropriate.

AREA OF EXPERTISE	EXPERIENCE	
	Some	Extensive

Code	Expertise
	WRITING & PUBLIC PRESENTATIONS
101	Writing technical documents/instruction manuals
102	Preparation of technical proposals
103	Evaluation of technical proposals
104	Technical information writing for the general public
105	Writing for technical/trade publications
106	Writing research articles
107	Author/Co-author of technical/research publications
108	Public presentation of technical/research work
109	Film/Video production
110	Other, specify: _____
	TECHNICAL ADVICE/LIAISON
	Technical advice to:
211	Construction/trades/processing personnel
212	Engineering technical personnel
213	Industrial plant managers
214	Research & dev. personnel
215	Other, specify: _____
	Technical liaison with:
221	Manufacturers and suppliers
222	Clients & engineers
223	Research & development personnel
224	Other, specify: _____
	SUPERVISORY EXPERIENCE
301	Engineering Technicians and Technologists
302	Construction and Trades Personnel
303	Industrial Process Personnel
304	Laboratory technical personnel
305	Field crews
306	Other, specify: _____

Code	Expertise
	TECHNICAL MANAGEMENT
401	Project management
402	Project coordination/logistics
403	Project administration
404	Cost control management
405	Construction management
406	Land/property development
407	Contract negotiations admin.
408	Other, specify: _____
	ADMINISTRATION & MGMT.
501	Financial/Budget management
502	General operations/Dept. mgmt.
503	Owning/Managing a technical bus.
504	Policy planning/development
505	Staff recruitment and selection
506	Staff training and development
507	Other, specify: _____
	EDUCATION/TEACHING EXPERIENCE
601	Community college
602	Technical training courses
603	Development of Educational Programs/Curricula
604	Development of Technical Training Programs
605	Other, specify: _____

6. LEVEL OF SUPERVISORY/MANAGEMENT EXPERIENCE

Indicate your level of responsibility as of November 15, 1986.

Executive	01	Technical Specialist	06
Manager	02	Group Leader	07
Department Head	03	Technical	08
Senior Supervisor	04	Trainee	09
Supervisor	05	Other (Specify) _____	10

How many employees do you supervise, other than yourself? _____

7. PRINCIPAL WORK ENVIRONMENTS

(Show current and all previous experience beginning with most recent.)
Check 'some' or 'extensive' as appropriate and indicate number of years of experience.

	ENVIRONMENT Code	EXPERIENCE Some	EXPERIENCE Extensive	Year(s)
Most Recent				
Previous Positions				

Code	Work Environment
01	Processing/Manufacturing Industry
02	Construction Firm
03	Public utilities
04	Government
05	Consulting firm
06	Design Engineering firm
07	Research institute/centre
08	University
09	Other educational institution
10	The armed forces
11	Field work on land
12	Field work underground
13	Field work offshore/at sea
14	Field work overseas
15	Other, specify: _____

8. PRINCIPLE INDUSTRY SECTOR DETAILS

(Complete one line for each sector in which you have obtained experience.)
Check 'some' or 'extensive' as appropriate and indicate years of experience.

	SECTOR CODE	EXPERIENCE		
		Some	Extensive	Year(s)
Most Recent				
Previous Positions				

Code	Sector
	FOSSIL FUEL RESOURCES
	Type of fuel
010101	Conventional crude petroleum & natural gas
010102	Oil sands and heavy oil
010103	Coal
010104	Other, specify _____
010200	Exploration
010300	Drilling
010400	Production
010500	Facilities
010600	Pipelines
010700	Geotechnical studies
010800	Other, specify _____
	MINERAL RESOURCES/MINING
	Type of ore
020101	Ferrous metal
020102	Base metal
020103	Precious metal
020104	Uranium
020105	Industrial/nonmetallic minerals
020106	Other, specify _____
020200	Underground mines
020300	Surface mines/quarries
020400	Milling & concentrating
020500	Corrosion studies
020600	Geotechnical studies
020700	Other, specify _____
	AGRICULTURE
030100	Farm land resources
030200	Farm mechanization
030300	Crop processing and storage
030400	Drainage and irrigation
030500	Agricultural facilities/bldgs.
030600	Waste handling & energy conservation
030700	Other, specify _____
	FORESTRY & LOGGING
040100	Forests & Woodlands
040200	Logging
040300	Forests/wood industries
040400	Other, specify _____

Code	Sector
	FISHERIES
050100	Fishery resources
050200	Fish by-products processing
050300	Fishing vessels, gear and equip.
050400	Other, specify _____
	CONSTRUCTION & MUNICIPAL
060100	Buildings
060101	Residential
060102	Commercial/institutional
060103	Light industrial
060104	Heavy industrial
060105	Power plants
060106	Offshore structures
060200	Building Systems
060201	Heating, ventilation & air conditioning (HVAC)
060202	Fire and safety systems
060203	Lighting systems
060204	Control systems
060205	Other, specify _____
060300	Municipal
060301	Sewers & sewage treatment
060302	Hydraulics
060303	Water control structures & systems
060304	Industrial waste management
060305	Storm drainage and control
060306	Other, specify _____
060400	Additional experience
060401	Materials estimation
060402	Construction inspection & supervision
060403	Project management
060404	Land development
060405	Geotechnical studies
060406	Other, specify _____
060500	Specialized experience with construction materials
060501	Concrete & allied products
060502	Structural steel
060503	Wood
060504	Plastics
060505	Ceramics & glass
060506	Other, specify _____

Code	Sector
	TRANSPORTATION
070100	Roads & highway systems
070200	Bridges & overpasses
070300	Tunnels & subways
070400	Railway systems
070500	Harbours
070600	Canal systems
070700	Airports
070800	Aerospace Systems
070900	Traffic control systems
071000	Pipelines
071100	Storage & warehousing
071200	Other, specify _____
	ENERGY
080100	Electric power generation
080200	Electric power transmission and distribution
080300	Industrial power systems
080400	Nuclear power
080500	Oil and Natural gas pipelines & storage
080600	Energy management
080700	Other, specify _____
	ENVIRONMENTAL ENGINEERING & GEOSCIENCES
090100	Environmental monitoring & assess.
090101	Atmospheric
090102	Lands
090103	Waters
090104	Others, specify _____
090200	Waste management
090300	Remote sensing
090400	Subsurface exploration & assess
090500	Marine & ocean engineering
090600	Wildlife management
090700	Other, specify _____

Code	Sector
	COMMUNICATIONS, ELECTRONICS & CONTROL SYSTEMS
100100	Electrical circuitry
100101	Analogue
100102	Digital
100103	Control systems
100104	Microprocessor based systems
100105	Other, specify: _____
100200	Telecommunication networks
100201	Telephone, telegraph, telex
100202	Radio
100203	Television
100204	Microwave
100205	Navigation Systems
100206	Satellites
100207	Fibre optics
100208	Other, specify: _____
100300	Computers
100301	Hardware
100302	Software
100303	Firmware
100304	Peripherals
100305	Other, specify: _____
100400	Industrial robotics
100500	Electronic test equipment
100600	Scientific/medical electronics
100601	Nuclear
100602	X-ray
100603	Radiography
100604	Prosthetics Devices
100605	Other, specify: _____
100700	Specialized communication systems
100701	Sonar
100702	Radar
107703	Other, specify: _____
100800	Postal/Courier Services
100900	Other, specify: _____

Code	Sector
	MANUFACTURING
110100	Foods
110200	Beverages
110300	Rubber products
110400	Plastic products
110500	Textiles and leather
110600	Wood products
110700	Pulp and paper
110701	Chemical pulping
110702	Mechanical pulping
110703	Bleaching
110704	Papermaking
110705	Effluents
110706	Coatings
110707	Other, specify: _____
110800	Printing and publishing
110900	Metals smelting and refining
110901	Smelting
110902	Hydrometallurgy
110903	Pyrometallurgy
110904	Electrolytic techniques
110905	Other, specify: _____
111000	Metal fabrication
111001	Structural
111002	Pressure vessels
111003	Mechanical equipment
111004	Casting and foundry work
111005	Extrusions
111006	Wire and rod
111007	Forging
111008	Rolling
111009	Welding
111010	Other, specify: _____
111100	Machinery (excluding electrical)
111101	Agricultural implements
111102	HVAC systems
111103	Hydraulics/Pneumatics
111104	Construction/mining/material handling equipment
111105	Other, specify: _____
111200	Transportation Equipment
111201	Aircraft & Parts
111202	Cars/Trucks/Trailers & Parts
111203	Railroad rolling stock
111204	Shipbuilding
111205	Space vehicles
111206	Other, specify: _____

Code	Sector
	MANUFACTURING CONTINUED
111300	Electrical and electronic products
111301	Appliances
111302	Lighting systems
111303	Audio/Acoustic systems
111304	Navigational equipment
111305	Telecommunications equipment
111306	Computers and associated equipment
111307	Industrial equipment
111308	Semi-conductors
111309	Other, specify: _____
111400	Non-metallic mineral products and construction materials
111500	Petroleum, coal, and gas products
111501	Production
111502	Refining
111503	Other, specify: _____
111600	Chemicals and chemical products
111610	Industrial & inorganic chemicals
111611	Chloalkalis
111612	Mineral acids
111613	Sulphur products
111614	Other, specify: _____
111620	Agricultural chemicals
111621	Pesticides
111622	Fertilizers
111623	Other, specify: _____
111630	Petrochemicals:
111631	Primary/Monomers
111632	Elastomers, plastics resin
111633	Solvents
111634	Other, specify: _____
111640	Organic & specialty chemicals
111641	Detergents & surfactants
111642	Water treatment chemicals
111643	Paints & protective coatings
111644	Chemical intermediates
111645	Other, specify: _____
111650	Pharmaceuticals & medicines
111660	Other, specify: _____
111700	Scientific and professional equipment
111800	Other, specify: _____
120000	**OTHER PRINCIPAL INDUSTRY SECTORS** Specify _____ _____ _____

9. OTHER SKILLS

(Show current and all previous experience beginning with most recent.)
Check 'some' or 'extensive' as appropriate and indicate years of experience.

	SKILL AREA Code	EXPERIENCE Some	EXPERIENCE Extensive	Year(s)
Most Recent				
Previous Positions				

Code	Sector
	DRAFTING, DESIGN & SPEC.
1100	Drafting
1110	Shop drawings
1120	Detailing
1130	Project
1140	Presentation drawing
1150	Computer aided drafting
1160	Other, specify: _____
1200	Design
1210	Detail design
1220	Design modification
1230	Conceptual design
1240	Computer aided design & mfg.
1250	Process design
1260	Product
1270	Other, specify: _____
1300	Specifications
1310	Interpretation
1320	Writing and developing
1330	Specialized area, specify: _____
1340	Other, specify: _____
	SURVEYING
2100	Architectural
2200	Urban and regional planning
2300	Resources exploration
2400	Cartographic
2500	Other, specify: _____

Code	Sector
	EQUIPMENT MAINTENANCE
3010	General industrial/plant machinery & equipment
3020	General fabrication process machinery
3030	General industrial/institutional facilities equipment
3040	Heating ventilation & air conditioning systems
3050	Piping systems
3060	Fire detection & prevention systems
3070	Central control systems
3080	Lighting systems
3090	Motor controls
3100	Power distribution & protection systems
3110	Material handling equipment
3120	Communications & control systems
3130	Microprocessor based systems
3140	Computer hardware
3141	mini
3142	micro
3143	main-frame
3150	Other, specify: _____

Code	Sector
	INDUSTRIAL ENG./MFG PROCESSES
4100	Materials testing
4110	Materials properties analysis
4120	Performance testing
4130	Component & parts failure analysis
4140	Non-destructive testing
4150	Other, specify: _____
4200	Fabrication materials & processes
4210	Sheet metal
4220	Wood
4230	Structural steel
4240	Plastics
4250	Composites
4260	Other, specify: _____
4300	Test cells/rigs
4310	Conducting tests
4320	Developing test procedures
4330	Developing test equipment
4340	Other, specify: _____
4400	Manufacturing processes
4401	Process troubleshooting
4402	Procedures analysis and modifications
4403	Tooling requirements evaluation
4404	Material & labour resource estimating

Code	Sector
4405	Assembly/production line balancing & supervision
4406	Process design & development
4407	Prototype/production model design & development
4408	Equipment design
4409	Packaging
4410	Other, specify: _____
4500	Process controls/automation
4510	Computerized numerical controls
4520	Automated production/ robotization
4530	Modification of computer software
4540	Other, specify: _____
4600	Additional experience
4610	Fire & safety systems
4620	Plant & office layout
4630	Labour standards development and maintenance
4640	Industrial health/safety
4700	Other, specify: _____
	COMPUTER
5100	Data manipulation and analysis
5200	Scientific programming
5300	Modelling & simulation
5400	Development of specialized software
5500	Other, specify: _____

10. ADDITIONAL TRADES AND ANALYTICAL SKILLS

Other Trade Skills, Specify: _____

_____

_____

Other Analytical Skills, Specify: _____

_____

_____

APPENDIX D

"COUNT ME IN"

MANITOBA TECHNOLOGIST, VOL. 16, NO. 5

MANITOBA TECHNOLOGIST

Official Publication of the Manitoba Society of Certified Engineering Technicians and Technologists Incorporated

VOLUME 16 NO. 5 DECEMBER 1986

"Count Me In"

Work is underway to develop a national human resources databank for technicians and technologists. Funded under a joint agreement with Canada Employment and Immigration, MANSCETT is conducting a pilot survey of the membership over the next two months. If successful in Manitoba, the pilot will provide a basis for a program covering all CCTT member societies.

In announcing final approval for the project, George Kokich of CEIC stated, "This is a real opportunity for the Manitoba Society and the national association to enhance the profile of technicians and technologists."

All Certified and Associate MANSCETT members should complete the questionnaire included with this edition of the Manitoba Technologist. It asks for basic information to update MANSCETT membership records. There is also a section covering current employment and previous experience. No specific information on any single member will be released.

The employment data will provide the basis to develop a profile of technicians and technologists and their employers. This profile will help MANSCETT and CEIC understand how job requirements in Manitoba are changing and what response may be warranted. But, it can only be done IF THE MEMBERSHIP PROVIDES THE INFORMATION.

The survey has been contracted to DALCOR Innoventures Ltd., a Western Canadian Human resources consulting firm. The entire cost of the project is covered by Employment and Immigration.

MANSCETT will receive substantial benefits from the work. A computerized membership record system will be operational on MANSCETT's own computer by the time the project is finished. This will simplify office administration and is in addition to the comprehensive database summarizing the skills and experience of the members.

Please support the program. Take a few minutes right now to complete the questionnaire and return it in the envelope provided as soon as possible.

WE ARE COUNTING ON YOU TO COUNT YOURSELF IN

APPENDIX E

STATISTICAL REPORT

MANSCETT MEMBERSHIP ANALYSIS
(by SEX/AGE COHORT - Total Numbers)

Total Records: 628

	TOTAL	- SEX - MALE	FEMALE	-- AGE COHORT -- 15-24	25-34	35-44	45-54	55-64	65+++
EMPLOYMENT STATUS									
Employed	568	556	12	50	253	179	60	21	5
Self-Employed	19	18	1	1	2	9	4	3	0
Unemployed	20	20	0	4	9	5	1	1	0
Retired	8	8	0	0	0	0	2	1	5
Other	6	5	1	2	2	1	0	1	0
TOTAL	621	607	14	57	266	194	67	27	10
SEX									
Male	613	613	0	54	260	194	69	26	10
Female	15	0	15	4	7	1	0	1	2
TOTAL	628	613	15	58	267	195	69	27	12
RESIDENCE									
R1	9	8	1	0	4	4	1	0	0
R2	259	253	6	26	117	77	26	8	5
R3	196	191	5	22	81	60	20	9	4
R4	6	6	0	1	4	1	0	0	0
R5	1	1	0	0	1	0	0	0	0
R6	5	4	1	1	2	1	0	1	0
R7	25	25	0	2	8	9	5	1	0
R8	8	8	0	0	5	2	1	0	0
R9	9	9	0	2	5	1	0	1	0
Other	102	102	0	4	38	38	15	7	0
TOTAL	620	607	13	58	265	193	68	27	9
EDUCATION									
Civil	113	112	1	4	46	34	18	9	2
Structural	43	42	1	2	20	14	5	2	0
Transport	0	0	0	0	0	0	0	0	0
Municipal	8	8	0	1	3	1	2	1	0
Surveying	6	6	0	0	3	2	1	0	0
Construction	4	4	0	0	3	1	0	0	0
Architectural	6	5	1	0	2	3	1	0	0
Mechanical	116	114	2	14	41	43	11	5	2
Electrical	66	65	1	8	25	24	4	4	1
Electron/Comput	173	172	1	20	79	44	23	4	3
Chemical	0	0	0	0	0	0	0	0	0
Min. Res./Metal	1	1	0	0	0	0	1	0	0
Industrial	0	0	0	0	0	0	0	0	0
Environ/Geosc	0	0	0	0	0	0	0	0	0
Biolog/Biomed	0	0	0	0	0	0	0	0	0
Other	9	9	0	0	2	2	2	1	2
TOTAL	545	538	7	49	224	168	68	26	10

MANSCETT MEMBERSHIP ANALYSIS
(by SEX/AGE COHORT - Total Numbers)

Total Records: 628

	TOTAL	- SEX - MALE	FEMALE	-- AGE COHORT -- 15-24	25-34	35-44	45-54	55-64	65+
DISCIPLINE OF WORK (1)									
Civil	71	71	0	1	28	25	10	6	1
Structural	32	29	3	3	16	7	5	1	0
Transport	7	7	0	0	2	3	2	0	0
Municipal	25	25	0	3	10	8	4	0	0
Surveying	7	7	0	0	3	3	1	0	0
Construction	41	41	0	2	18	15	3	2	1
Architectural	9	7	2	1	5	2	1	0	0
Mechanical	109	106	3	12	40	43	6	5	3
Electrical	64	63	1	7	31	16	5	3	2
Electron/Comput	153	152	1	18	75	40	18	1	1
Chemical	1	1	0	0	0	1	0	0	0
Min. Res./Metal	3	3	0	0	0	2	1	0	0
Industrial	5	5	0	0	3	1	0	1	0
Environ/Geosc	6	6	0	1	2	1	2	0	0
Biolog/Biomed	5	5	0	0	2	2	0	1	0
Other	81	77	4	6	30	25	11	7	2
TOTAL	619	605	14	54	265	194	69	27	10
WORK FUNCTION (1)									
Drafting	57	53	4	5	33	9	7	3	0
Design & Spec	87	84	3	8	31	33	6	8	1
Equip Install	112	112	0	21	58	26	7	0	0
Inspect/Maint.	22	21	1	3	12	3	3	1	0
Plant Ops/Prod	32	32	0	2	16	11	2	0	1
Quality Control	21	21	0	2	11	7	1	0	0
Standards	16	16	0	0	10	2	3	1	0
Laboratory Anal	4	4	0	0	1	2	0	0	1
Product Devel	12	12	0	2	4	6	0	0	0
Instrumentation	14	14	0	2	7	3	0	1	1
Proj. Admin	45	44	1	0	23	13	6	2	1
R and D	25	25	0	1	11	9	4	0	0
Marketing	32	30	2	1	16	11	2	1	1
Management	76	75	1	1	15	36	17	4	3
Education	19	19	0	0	2	6	5	5	1
Other	42	40	2	5	16	14	6	1	0
TOTAL	616	602	14	53	266	191	69	27	10
MGR & SUPVR LEVEL									
Executive	16	16	0	0	3	8	4	1	0
Manager	58	57	1	2	15	27	10	3	1
Depart. Head	31	31	0	1	13	8	6	2	1
Senior Supervsr	40	40	0	0	9	11	10	7	3
Supervisor	76	76	0	3	26	32	12	3	0
Technical Spec.	154	152	2	5	86	44	9	8	2
Group Leader	31	31	0	1	12	13	5	0	0
Technical	95	91	4	13	54	21	4	1	2
Trainee	26	23	3	12	14	0	0	0	0
Other	22	22	0	2	5	10	4	1	0
TOTAL	549	539	10	39	237	174	64	26	9

MANSCETT MEMBERSHIP ANALYSIS
(by SEX/AGE COHORT - Total Numbers)

Total Records: 628

	TOTAL	- SEX - MALE	FEMALE	-- AGE COHORT -- 15-24	25-34	35-44	45-54	55-64	65+++
WORK ENVIRONMENT (1)									
Proc/Manuf Ind.	139	136	3	19	59	49	7	2	3
Construct Firm	49	49	0	2	25	17	2	3	0
Public Utility	106	105	1	8	45	33	16	2	2
Government	93	91	2	3	35	26	20	8	1
Consulting Firm	63	60	3	3	35	18	4	3	0
Design Eng Firm	22	22	0	2	13	5	1	1	0
Research Centre	17	17	0	2	2	9	4	0	0
Univeraity	7	7	0	0	0	4	2	0	1
Other Education	18	18	0	1	1	7	4	3	2
Armed Forces	8	8	0	0	1	5	1	1	0
Fd Wrk - Land	32	32	0	7	18	5	1	1	0
Fd Wrk-Undergnd	4	4	0	0	3	1	0	0	0
Fd Wrk-Offshore	0	0	0	0	0	0	0	0	0
Fd Wrk-Overseas	1	1	0	0	0	1	0	0	0
Other	52	48	4	6	26	13	5	2	0
TOTAL	611	598	13	53	263	193	67	26	9
SECTOR EXPERIENCE (1)									
Fossil Fuel Res	13	13	0	0	5	6	0	1	1
Mineral Rearca	9	9	0	0	5	2	2	0	0
Agriculture	7	7	0	0	2	2	1	1	1
Forestry/Loggng	2	2	0	0	0	0	1	1	0
Fisheries	0	0	0	0	0	0	0	0	0
Const & Municpl	228	221	7	11	105	75	25	9	3
Transportation	45	45	0	4	9	19	7	6	0
Energy	54	53	1	9	21	17	5	1	1
Environment Eng	15	15	0	0	7	5	3	0	0
Comm/Elect/Ctrl	132	131	1	18	62	29	17	4	2
Manufacturing	93	90	3	12	44	31	4	1	1
Other Sectors	13	13	0	0	5	6	2	0	0
TOTAL	611	599	12	54	265	192	67	24	9
CCDO BREAKDOWN									
2160-Supervisor	122	120	2	4	34	48	27	7	2
2161-Surveyors	3	3	0	0	1	2	0	0	0
2163-Drafting	21	20	1	1	13	4	2	1	0
2165-Eng. Techs	478	466	12	53	218	140	39	18	10
2169-Other Tech	4	4	0	0	1	1	1	1	0
nnnn-Other Occs	0	0	0	0	0	0	0	0	0
TOTAL	628	613	15	58	267	195	69	27	12

Note: (1) Based on most recent experience. Excludes experience in previous positions
(2) Numbers shown are for those persons actually responding to the specific questions on the questionnaire

APPENDIX F

CEIC-MANSCETT-CCTT COMMITTEE

October 22, 1986

LIST OF NAMES, ADDRESSES AND TELEPHONE NUMBERS
CEIC-MANSCETT-CCTT COMMITTEE

1. Mr. Charles Brimley
Executive Director
Canadian Council of Technicians
and Technologists
880 Wellington Street
Suite 807
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K1R 6K7 (613) 238-8123

2. Mr. J.F. David
Director, Manufacturing
Labour Market Services
Employment and Immigration Canada
Place du Portage, Phase IV
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140 Promenade du Portage
Hull, Québec
K1A 0J9 (819) 994-3851

3. Mr. Bill Dowhopoluk
President
Manitoba Society of Certified Engineering
Technicians and Technologists Inc.
5-1767 Portage Avenue
Winnipeg, Manitoba
R3J 0E7 (204) 956-0980

4. Mr. Seaford Jack
Director, CCTT Public Affairs
1410 One Lombard Place
Winnipeg, Manitoba
R3B 0X5 (204) 934-5729

5. Mr. George Kokich*
A/Chief
Labour Supply Analysis
Labour Market Outlook and
Structural Analysis
Employment and Immigration Canada
Place du Portage, Phase IV, Rm. 835
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6. Mr. Jim Treller
Manager, Economic Services Branch
Employment and Immigration Canada
Room 710, Eaton Place
330 Graham Avenue
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R3C 4B9 (204) 983-4079

7. Mrs. Terry Whiteman
Registrar, MANSCETT
(204) 885-2788

8. OBSERVER
Mrs. J.K. Joanne Daoust
Human Resource Consultant
Manitoba Region
Employment and Immigration Canada
330 Graham Avenue
Winnipeg, Manitoba
R3C 4B9
(204) 983-3750

* Committee Chairman.

APPENDIX G

PROJECT OBJECTIVES

OBJECTIVE. The overall objective of the second pilot project is to develop a comprehensive, computerized inventory and related data base concerning MANSCETT's membership and potential members by type of occupation in Manitoba using the said occupational checklist (in whole or part) that will:

1) facilitate MANSCETT's subsequent task of efficiently maintaining and updating such information, as well as linking individual records on a continuing annual basis,

2) permit the analysis of historical, current and future types of such information on a crossectional or longitudinal basis;

3) serve as an operational model that can be used by CCETT and other Provincial Associations of Engineering Technicians and Technologists; and,

4) allow MANSCETT, CCETT as well as constituent associations to provide CEIC with a continuous and consistent breakdown of statistics on such occupations by type and location at low cost.

DELIVERABLES:

The specific objectives of the second pilot project are fourfold:

1) to produce a brief report that identifies and synthesizes the trends regarding technological change in Canada relative to computer hardware, software and EDP in order to provide occupation - specific recommendations to MANSCETT concerning the perceived short term and long term impact of such trends on the number of engineering technicians and technologists in Manitoba by type of occupation;

2) to prepare a draft report concerning relative occupational information for review which is specified in the next paragraph, as well as produce a final report which will incorporate suggested revisions from MANSCETT and CEIC to the said draft report;

3) to provide MANSCETT with both the survey questionnaires (completed in whole or in part for this pilot project), as well as the corresponding raw data by individual on one or more 5 1/4'' floppy diskettes that can be used with an IBM or IBM compatible micro computer; and,

4) in the event that it is necessary to develop new software relative to the utilization of an acceptable software package (cf. next paragraph, item 6), to provide both CEIC and MANSCETT with a copy of the said new software package that can be used with an IBM or IBM compatible micro computer.

In order to prepare the above indicated draft and final reports, the following work will be required relative to about 1,500 MANSCETT members (including students), and an estimated 4,500 engineering technicians and technologists, who work in Manitoba in related occupations, but are not members of MANSCETT:

1) design, test and implement an acceptable survey questionnaire (incorporating all or part(s) of the attached occupational checklist, in order to collect selected occupational data by type of occupation on certified engineering technicians and technologists in Manitoba that are members of MANSCETT, as well as develop a computerized inventory of such occupations; for information see MANSCETT application form - Annex IV - pages 1-2; and MANSCETT Professional Reference Questionnaire - Annex V - pages 1-2

2) develop and apply an approach to establish rough estimates of engineering technicians and technologists by type of occupation in Manitoba that are not members of MANSCETT, in order to develop a computerized inventory of the same types of occupations as defined for MANSCETT members;

3) develop and apply an approach to combine the preceding occupational data (including estimates) into one computerized inventory, in order to allow the analysis of computer output for the preceding groups of engineering technicians and technologists considered to-gether, those who belong to MANSCETT, or those who do not;

4) use the Canadian Classification and Dictionary of Occupations (CCDO) or an occupational classification that is compatable with the CCDO, in order to code the above-indicated data by detailed types of occupation at the 7 digit code level;

5) develop and apply a flexible, geographic classification system in order to code the preceding data by location within Manitoba, as well as facilitate comparisons with other geographic classifications, such as the federal census. In this regard, information to be collected from survey respondents shall include their street address and postal code, in order to allow the said data by location to be checked and coded in detail;

6) utilize an acceptable software package such as Lotus 123 and DBase 3 on a 5 1/4'' floppy diskette for use with an IBM PCXT operating system, in order to facilitate both the simple manipulation of such data indicated above as well as MANSCETT's planned addition of related longitudinal data subsequent to the completion of this pilot project; and,

7) review the practical problems of storing, maintaining and updating the preceding data in order to provide comprehensive, technical recommendations concerning such computer - related functions. Such recommendations shall include those concerning the treatment of both the manual and computerized versions of <u>confidential</u> information or raw data received on the said survey questionnaire as well as to be received on subsequent questionnaires.

Contractor will not have access to any records of personal information related to any identifiable individual(s) nor to any information obtained under the Unemployment Insurance Act from any person.

For Delivery to MANSCETT Only

i) an integrated, comprehensive, computerized inventory and related data base concerning MANSCETT's membership and potential members by type of occupation in Manitoba,
ii) the test survey questionnaires and results,
iii) approximately 1,500 survey questionnaires, completed in whole or in part by MANSCETT members for this pilot project,
iv) relative to the preceding, the corresponding raw data by individual on one or more 5 1/4'' floppy diskettes that can be used with an IBM or IBM compatible micro computer.

1) For Delivery To CEIC and MANSCETT

i) a brief written report regarding technological change in Canada,
ii) a draft written report concerning relative occupational information,
iii) a final written report,
iv) if applicable, a copy of a developed software package (including related systems documentation).

APPENDIX H

System User Manual

NOTE: This system user manual is not included in the published report to respect the confidentiality of MANSCETT's computerized database. Any questions concerning the manual should be addressed to MANSCETT or CCTT.

APPENDIX I

"Implications of the EIC-Manscett Membership Survey Project For Canada's Technicians and Technologists".

George Kokich, Employment and Immigration Canada

IMPLICATIONS OF THE EIC-MANSCETT MEMBERSHIP SURVEY PROJECT FOR CANADA'S TECHNICIANS AND TECHNOLOGISTS.

by

George J.V. Kokich
Acting Chief, Labour Supply Analysis
Labour Market Outlook and Structural Analysis
Employment and Immigration Canada

(This Article Was Prepared During February, 1987).

There is a membership survey underway in Manitoba that promises a number of benefits for Canada's technicians and technologists. The survey is a collaborative effort between the Manitoba Society of Certified Engineering Technicians and Technologists (MANSCETT), and Employment and Immigration Canada (EIC). It is being carried out as a result of a Memorandum of Understanding that was signed between EIC and both the Canadian Council of Technicians and Technologists (CCTT) and MANSCETT on September 14, 1984.

When this final, joint pilot project is completed around the end of March, 1987, MANSCETT in cooperation with CCTT will receive a comprehensive, computerized inventory of Manitoba's membership. It will contain basic biographic, demographic, geographic, education, employment, occupation and industry characteristics. MANSCETT will also receive a software package to facilitate the use of the inventory. A consulting firm, Dalcor Innoventures Ltd. of Edmonton, is conducting the survey and will submit two reports at the end of the project. The first will provide a summary about the survey and a set of recommendations concerning the results of this project; the second will focus on the subject of technological change in Canada and its implications for engineering technicians and technologists in both Manitoba and Canada.

The EIC-MANSCETT project was a major topic of discussion at the recent annual meeting of CCTT's National Directors held in Regina during November, 1986. During that meeting, the National Directors by unanimous approval passed two Motions: First, that the Constituent Members of the Canadian Council of Technicians and Technologists move toward the adoption of a standardized procedure for collecting database information, following the CEIC Canadian Occupational Projection System (COPS) formula used in Manitoba, and that the link and means of dialogue with the Constituent Members be via the CCTT Regional Conferences and through the Constituent Members' offices. Secondly, it was agreed that collaboration with COPS on other related issues should increase.

Given the preceding, there are a number of implications that technicians and technologists should be aware of. MANSCETT to begin with, will be in a position to provide a leadership role regarding the uses of the inventory. CCTT and every Constituent Member Association are committed to collaborate on a team basis in using the results of the project as a building block in promoting your profession. Further, over the coming months, it is expected that CCTT's activities related to the survey will include a review of the

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EIC-MANSCETT project results, and a comparison of such results with other recent related provincial studies by British Columbia and Alberta concerning the impact of technological change on technicians and technologists in order to develop and implement a standardized membership questionnaire for all other Provincial Associations. CCTT may also consider moving to create the first comprehensive national database on Canada's technicians and technologists.

Should such a database become a goal, then once conducted and assembled, the new national database would basically allow CCTT and each Constituent Member Association to provide higher quality services in conducting national and provincial human resource planning and analysis; liaison with government, industry and educational institutions; and, job search counselling. It would be possible, for example, to quickly access more timely data indicating national and provincial trends and patterns, as well as compare regional variations in employment projections. In this regard, it is expected that the national database would be used alone, as well as in relation to other national databases, such as the Canadian Engineering Manpower Inventory on Engineers, and EIC's COPS database which includes relevant historical and current data and projections based on other statistical sources.

On an individual basis, technicians and technologists would be in a stronger position to plan and manage their own career path by taking the initiative to use the new database in order to assess the labour market, improve job finding prospects, as well as see where one personally fits into the profession.

There is one other implication that needs to be mentioned. To date, EIC has collaborated extensively with CCTT and MANSCETT. The success of the preceding initiatives, however, will also depend on the individual member's cooperation and support. More specifically, the role and willingness of each member to participate in obtaining a high response rate by completing every part of any forthcoming national questionnaire being planned by CCTT, will be essential in allowing both the individual members and CCTT to eventually optimize the potential uses and benefits of a national membership inventory.

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